

Glossary

This glossary was compiled from Internet Sites at the USGS, NASA, Goddard Space Center, Canadian Center for Remote Sensing, and the ASPRS

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A

Absolute temperature	Temperature measured on the Kelvin scale, whose base is absolute zero, i.e. -273 °C (0 °C is expressed as 273 °K).
Absorptance	A measure of the ability of a material to absorb EM energy at a specific wavelength.
Absorption band	Wavelength interval within which electromagnetic radiation is absorbed by the atmosphere or by other substances.
Absorptivity	Capacity of a material to absorb incident radiant energy.
Achromatic vision	The perception by the human eye of changes in brightness, often used to describe the perception of monochrome or black and white scenes.
Active remote sensing	Remote sensing methods that provide their own source of electromagnetic radiation to illuminate the terrain. Radar is one example.
Acuity	A measure of human ability to perceive spatial variations in a scene. It varies with the spatial frequency, shape, and contrast of the variations, and depends on whether the scene is colored or monochrome.
Additive primary colors	Blue, green, and red. Filters of these colors transmit the primary color of the filter and absorb the other two colors.
Adiabatic cooling	Refers to decrease in temperature with increasing altitude.
Advanced very high resolution radiometer (AVHRR)	Crosstrack multispectral scanner on a NOAA polar-orbiting satellite that acquires five spectral bands of data (0.55 to 12.50 µm) with a ground resolution cell of 1.1 by 1.1 km.
Aerial magnetic survey	Survey that records variations in the earth's magnetic field.
Aeromagnetic	Aeromagnetic is descriptive of data pertaining to the Earth's magnetic field which has been collected from an airborne sensor.
AGL	Above ground level.
Air base	Ground distance between optical centers of successive overlapping aerial photographs.
Airborne imaging spectrometer (AIS)	Along-track multispectral scanner with spectral bandwidth of 0.01 µm.
Airborne visible and infrared imaging spectrometer (AVIRIS)	Experimental airborne along-track multispectral scanner under development at JPL to acquire 224 images in the spectral region from 0.4 to 2.4 µm.
AID--Agency for International Development	The United States Federal agency for international development projects.
Albedo (A)	Ratio of the amount of electromagnetic energy reflected by a surface to the amount of energy incident upon it.
Albers Equal Area Projection	The Albers Equal Area projection is a method of projection on which the areas of all regions are shown in the same proportion of their true areas. The meridians are equally spaced straight lines converging at a common point, which is normally beyond the pole. The angles between them are less than the true angles. The parallels are unequally spaced concentric circular arcs centered on the point of convergence of the meridians. The meridians are radii of the circular arcs. The poles are normally circular arcs enclosing the same angle as that enclosed by the

other parallels of latitude for a given range of longitude. Albers Equal Area is frequently used in the ellipsoidal form for maps of the United States in the National Atlas of the United States, for thematic maps, and for world atlases. It is also used and recommended for equal-area maps of regions that are predominantly east-west in extent.

Along-track scanner	Scanner with a linear array of detectors oriented normal to flight path. The IFOV of each detector sweeps a path parallel with the flight direction.
Alteration	Changes in color and mineralogy of rocks surrounding a mineral deposit that are caused by the solutions that formed the deposit. Suites of alteration minerals commonly occur in zones.
Amplitude	For waves, the vertical distance from crest to trough.
Analog display	A form of data display in which values are shown in graphic form, such as curves. Differs from digital displays in which values are shown as arrays of numbers.
Analogue image	An image where the continuous variation in the property being sensed is represented by a continuous variation in image tone. In a photograph, this is achieved directly by the grains of photosensitive chemicals in the film; in an electronic scanner, the response in millivolts is transformed to a display on a cathode-ray tube where it may be photographed.
Angular beam width	In radar, the angle subtended in the horizontal plane by the radar beam.
Angular field of view	Angle subtended by lines from a remote sensing system to the outer margins of the strip of terrain that is viewed by the system.
Angular resolving power	Minimum separation between two resolvable targets, expressed as angular separation.
Anomaly	An area on an image that differs from the surrounding, normal area. For example, a concentration of vegetation within a desert scene constitutes an anomaly.
Antenna	Device that transmits and receives microwave and radio energy in radar systems.
Aperture	Opening in a remote sensing system that admits electromagnetic radiation to the film in radar systems.
APL	Applied Physics Laboratory of John Hopkins University.
Apollo	U.S. lunar exploration program of satellites with crews of three astronauts.
Apparent thermal inertia (ATI)	An approximation of thermal inertia calculated as one minus albedo divided by the difference between daytime and nighttime radiant temperatures.
ARC Export	EXPORT creates an ARC/INFO interchange file to transfer coverages, INFO data files, text files, and other ARC/INFO files between various computer systems. An interchange file contains all coverage information and appropriate INFO file information in a fixed length, ASCII format. It can be fully or partially compressed as well as uncompressed ASCII depending upon the given EXPORT option.
ARC SECOND	1/3600th of a degree (1 second) of latitude or longitude.
ARC/INFO	ARC/INFO is a geographic information system (GIS) used to automate, manipulate, analyze, and display geographic data in digital form. ARC/INFO is a proprietary system developed and distributed by the Environmental Systems Research Institute, Inc., in Redlands, California
ArcUSA	Designed by ESRI, ArcUSA is a general-purpose database used to generate thematic maps of the conterminous United States at the State and county levels. The database contains cartographic information, tabular information, and indices and is designed for a wide range of applications.

Areal	Relating to or involving an area.
Artifact	A feature on an image, which is produced by the optics of the system or by digital image processing, and sometimes masquerades as a real feature.
ASA index	Index of the American Standards Association designating film speed, or sensitivity to light. Higher values indicate higher sensitivity. The ASA index has been replaced by the ISO index.
Ascending node	Direction satellite is traveling relative to the Equator. An ascending node would imply a northbound Equatorial crossing.
ATI	Apparent Thermal Inertia.
Atmosphere	Layer of gases that surrounds some planets.
Atmospheric correction	Image-processing procedure that compensates for effects of selectivity scattered light in multispectral images.
Atmospheric shimmer	An effect produced by the movement of masses of air with different refractive indices, which is most easily seen in the twinkling of stars.
Atmospheric window	Wavelength interval within which the atmosphere readily transmits electromagnetic radiation.
Attributes	Attributes, also called feature codes or classification attributes, are used to describe map information represented by a node, line, or area. For example, an attribute code for an area might identify it to be a lake or swamp; an attribute code for a line might identify a road, railroad, stream, or shoreline.
Attitude	Angular orientation of remote sensing system with respect to a geographic reference system.
AVHRR	Advanced Very High Resolution Radiometer, a multispectral imaging system carried by the TIROS-NOAA series of meteorological satellites.
AVIRIS	Airborne visible and infrared imaging spectrometer.
Azimuth	Geographic orientation of a line given as an angle measured in degrees clockwise from north.
Azimuth direction	In radar images, the direction in which the aircraft is heading. Also called flight direction.
Azimuth resolution	In radar images, the spatial resolution in the azimuth direction.
B	
Background	Area on an image or the terrain that surrounds an area of interest, or target.
Backscatter	In radar, the portion of the microwave energy scattered by the terrain surface directly back toward the antenna.
Backscatter coefficient	A quantitative measure of the intensity of energy returned to a radar antenna from the terrain.
Band	A wavelength interval in the electromagnetic spectrum. For example, in Landsat images the bands designate specific wavelength intervals at which images are acquired.
Bandwidth	The total range of frequency required to pass a specific modulated signal without distortion or loss of data. The ideal bandwidth allows the signal to pass under conditions of maximum AM or FM adjustment. (Too narrow a bandwidth will result in loss of data during modulation peaks. Too wide a bandwidth will pass excessive noise along with the signal.) In FM, radio frequency signal bandwidth is determined by the frequency deviation of the signal.
Base height ratio	Air base divided by aircraft height. This ratio determines vertical exaggeration on stereo models.

Batch processing	Method of data processing in which data and programs are entered into a computer that carries out the entire processing operation with no further instructions.
Bathymetry	Configuration of the seafloor.
Beam	A focused pulse of energy.
BIA--Bureau of Indian Affairs, Department of the Interior	The BIA serves Indian and Alaska Native tribes living on or near reservations. The BIA administers and manages approximately 52 million acres of land held in trust for Indians by the United States and works with local tribal governments on issues including road construction and maintenance, social services, police protection, and economic development.
BIL (Band-Interleaved-by-Line)	BIL is a CCT tape format that stores all bands of satellite data in one image file. Scanlines are sequenced by interleaving all image bands. The CCT header appears once in a set.
Bilinear	The term bilinear is referring to a bilinear interpolation. This is simply an interpolation with two variables instead of one.
Bin	One of a series of equal intervals in a range of data, most commonly employed to describe the divisions in a histogram.
Binary	Based upon the integer two. Binary Code is composed of a combination of entities that can assume one of two possible conditions (0 or 1). An example in binary notation of the digits 111 would represent $(1 \times 2) + (1 \times 2) + (1 \times 2) = 4 + 2 + 1 = 7$.
Bit	Contraction of binary digit, which in digital computing represents an exponent of the base 2.
BIP--Band-Interleaved-by-Pixel	When using the BIP image format, each line of an image is stored sequentially, line 1 all bands, line 2 all bands, etc. For example, the first line of a three-band image would be stored as p1b1, p1b2, p1b3, p2b1, p2b2, p2b3, where p1b1 indicates pixel one, band one, p1b2 indicates pixel one, band two, etc.
Blackbody	An ideal substance that absorbs the entire radiant energy incident on it and emits radiant energy at the maximum possible rate per unit area at each wavelength for any given temperature. No actual substance is a true blackbody, although some substances, such as black lamps, approach this property.
Blind spot	The point of the optic nerve to the retina where no radiation is detected by the eye.
BLM--Bureau of Land Management, Department of the Interior	Under the Federal Land Policy and Management Act of 1976, the BLM administers and manages approximately 300 million acres of public lands primarily located in the western half of the lower 48 States and Alaska. Public lands in the U.S. contain mineral and timber reserves, support habitat for a host of wildlife, and provide recreational opportunities.
BOR--Bureau of Reclamation, Department of the Interior	The BOR was chartered in 1902 with the responsibility to reclaim arid lands in the western U.S. for farming by providing secure, year-around water supplies for irrigation. The BOR's responsibilities since have expanded to include generating hydroelectric power; overseeing municipal and industrial water supplies, river regulation, and flood control; enhancing fish and wildlife habitats; and researching future water and energy requirements.
BPI--Bits Per Inch	The tape density to which the digital data were formatted.
Brightness	Magnitude of the response produced in the eye by light.
Brute Force Radar	See real-aperture radar.
BSQ--Band Sequential	BSQ is a CCT tape format that stores each band of satellite data in one image file for all scanlines in the imagery array. The CCT headers are recorded on each band.
Byte	A group of eight bits of digital data.

C	
Calibration	Process of comparing an instrument's measurements with a standard.
Calorie	Amount of heat required to raise the temperature of 1g of water by 1 °C.
Camouflage detection photographs	Another term for IR color-photograph.
Cardinal point effect	In radar, very bright signatures caused by optimally oriented corner reflectors, such as buildings.
Cartographic	Pertaining to cartography, the art or practice of making charts or maps.
Cathode ray tube (CRT)	A vacuum tube with a phosphorescent screen on which images are displayed by an electron beam.
C band	Radar wavelength region from 3.8 to 7.5 cm.
CCD	Charge-coupled detector.
CCT	Computer-compatible tape.
CD-ROM--Compact Disc-Read Only Memory	CD-ROM is a computer peripheral that employs compact disc technology to store large amounts of data for later retrieval. The capacity of a CD-ROM disk is over 600 megabytes, the equivalent of over 250,000 typewritten pages.
Centerpoint	The optical center of a photograph.
Change-detection images	An image prepared by digitally comparing scenes acquired at different times. The gray tones or colors of each pixel record the amount of difference between the corresponding pixels of the original images.
Channels	A range of wavelength intervals selected from the electromagnetic spectrum.
Charge-coupled detector (CCD)	A device in which electrons are stored at the surface of a semiconductor.
Chlorosis	Yellowing of plant leaves resulting from an imbalance in the iron metabolism caused by excess concentrations of copper, zinc, manganese, or other elements in the plant.
Chromatic vision	The perception by the human eye of changes in hue.
CIR	Color infrared.
Circular scanner	Scanner in which a faceted mirror rotates about a vertical axis to sweep the detector IFOV in a series of circular scan lines on the terrain.
Classification	Process of assigning individual pixels of an image to categories, generally based on spectral reflectance characteristics.
Coastal zone color scanner (CZCS)	A satellite-carried multi-spectral scanner designed to measure chlorophyll concentrations in the oceans.
Coherent radiation	Electromagnetic radiation whose waves are equal in length and are in phase, so that waves at different points in space act in unison, as in laser and synthetic aperture radar.
Color composite image	Color image prepared by projecting individual black-and-white multispectral images, each through a different color filter. When the projected images are superposed, a color composite image results.
Color ratio composite image	Color composite image prepared by combining individual ratio images for a scene using a different color for each ratio image.
Complementary colors	Two primary colors of light (one additive and the other subtractive) that produce white light when added together. Red and cyan are complimentary colors.
Computer-compatible tape (CCT)	The magnetic tape on which the digital data for Landsat MSS and TM images are distributed.
Conduction	Transfer of electromagnetic energy through a solid material by molecular interaction.
Cones	Receptors in the retina, which are sensitive to color. There are cones sensitive to the red, green, and blue components of light.

Contact print	A reproduction from a photographic negative in direct contact with photosensitive paper.
Context	The known environment of a particular feature on an image.
Contrast	The ratio between the energy emitted or reflected by an object and its immediate surroundings.
Contrast enhancement	Image-processing procedure that improves the contrast ratio of images. The original narrow range of digital values is expanded to utilize the full range of available digital values.
Contrast ratio	On an image, the reflectance ratio between the brightest and darkest parts of an image.
Contrast stretching	Expanding a measured range of digital numbers in an image to a larger range, to improve the contrast of the image and its component parts.
Convection	Transfer of heat through the physical movement of matter.
Corner reflector	Cavity formed by two or three smooth planar surfaces intersecting at right angles. Electromagnetic waves entering a corner reflector are reflected directly back toward the source.
Corps	US Army Corps of Engineers (USACE)
COSMIC	Computer Software Management and Information Center, University of Georgia. This facility distributes computer programs developed by U.S. government-funded projects.
Cross polarized	Describes a radar pulse in which the polarization direction of the return is normal to the polarization direction of the transmission. Cross-polarized images may be HV (horizontal transmit, vertical return) or VH (vertical transmit, horizontal return).
Cross track scanner	Scanner in which a faceted mirror rotates about a horizontal axis to sweep the detector IFOV in a series of parallel scan lines oriented normal to the flight direction.
CRT	Cathode ray tube.
Cubic convolution	A high order resampling technique in which the brightness value of a pixel in a corrected image is interpolated from the brightness values of the 16 nearest pixels around the location of the corrected pixel.
Cut off	The digital number in the histogram of a digital image, which is set to zero during contrast stretching. Usually this is a value below which atmospheric scattering makes a major contribution.
CWA	Clean Water Act
Cycle	One complete oscillation of a wave.
CZCS	Coastal Zone color scanner.
D	
Dangling ARC	An arc having the same polygon on both its left and right sides and having at least one node that does not connect to any other arc. See dangling node.
Dangling node	The dangling endpoint of a dangling arc. Often identifies that a polygon does not close properly, that arcs do not connect properly, or that an arc was digitized past its intersection with another arc. In many cases, a dangling node may be acceptable. For example, in a street centerline map, cul-de-sacs are often represented by dangling arcs.
Data collection system (DCS)	On Landsats 1 and 2, the system that acquired information from seismometers, flood gauges, and other measuring devices. These data were relayed to ground receiving stations.

Datum	In surveying, a reference system for computing or correlating the results of surveys. There are two principal types of datums: vertical and horizontal. A vertical datum is a level surface to which heights are referred. In the United States, the generally adopted vertical datum for leveling operations is the national geodetic vertical datums of 1929 (differing slightly from mean sea level). The horizontal datum, used as a reference for position, is defined by: the latitude and longitude of an initial point, the direction of a line between this point and a specified second point, and two dimensions which define the spheroid. In the United States, the initial point for the horizontal datum is located at Meade's Ranch in Kansas.
Defense Meteorological Satellite Program (DMSP)	A U.S. Air Force meteorological satellite program with satellites circling in sun-synchronous orbit. Imagery is collected in the visible- to near-infrared band (0.4 to 1.1 micrometers) and in the thermal-infrared band (about 8 to 13 micrometers) at a resolution of about three kilometers. While some of the data is classified, most unclassified data is available to civilian users.
DEM--Digital Elevation Models	<p>The U.S. Geological Survey produces five primary types of digital elevation model data. They are:</p> <ul style="list-style-type: none"> 7.5-minute DEM (30- x 30-m data spacing, cast on Universal Transverse Mercator (UTM) projection or 1- x 1-arc-second data spacing). Provides coverage in 7.5- x 7.5-minute blocks. Each product provides the same coverage as a standard USGS 7.5-minute map series quadrangle. Coverage: Contiguous United States, Hawaii, and Puerto Rico. Degree DEM (3- x 3-arc-second data spacing). Provides coverage in 1- x 1-degree blocks. Two products (three in some regions of Alaska) provide the same coverage as a standard USGS 1-x 2-degree map series quadrangle. The basic elevation model is produced by or for the Defense Mapping Agency (DMA), but is distributed by USGS in the DEM data record format. Coverage: United States 30-minute DEM (2- x 2-arc-second data spacing). Consists of four 15- x 15-minute DEM blocks. Two 30-minute DEMs provide the same coverage as a standard USGS 30- x 60-minute map series quadrangle. Saleable units will be 30- x 30-minute blocks, that is, four 15- x 15-minute DEMs representing one half of a 1:100,000-scale map. Coverage: Contiguous United States, Hawaii. 15-minute Alaska DEM (2- x 3-arc-second data spacing, latitude by longitude). Provides coverage similar to a 15-minute DEM, except that the longitudinal cell limits vary from 20 minutes at the southernmost latitude of Alaska to 36 minutes at the northern most latitude limits of Alaska. Coverage of one DEM will generally correspond to a 1:63,360-scale quadrangle. 7.5-minute Alaska DEM (1- x 2-arc-second data spacing, latitude by longitude). Provides coverage similar to a 7.5-minute DEM, except that the longitudinal cell limits vary from 10 minutes at the southernmost latitude of Alaska to 18 minutes at the northernmost latitude limits of Alaska.
Densitometer	Optical device for measuring the density of photographic transparencies.
Density, of images	Measure of the opacity, or darkness, of a negative or positive transparency.
Density, of materials (ρ)	Ratio of mass to volume of a material, typically expressed as grams per cubic centimeter.

Density slicing	Process of converting the continuous gray tones of an image into a series of density intervals, or slices, each corresponding to a specific digital range. The density slices are then displayed either as uniform gray tones or as colors.
Depolarized	Refers to a change in polarization of a transmitted radar pulse as a result of various interactions with the terrain surface.
Depression angle (y)	In radar, the angle between the imaginary horizontal plane passing through the antenna and the line connecting the antenna and the target.
Descending Node	Direction satellite is traveling relative to the Equator. A descending node would imply a southbound Equatorial crossing.
Detectability	Measure of the smallest object that can be discerned on an image.
Detector	Component of a remote sensing system that converts electromagnetic radiation into a recorded signal.
Developing	Chemical processing of an exposed photographic emulsion to produce an image.
Dielectric constant	Electrical property of matter that influences radar returns. Also referred to as complex dielectric constant.
Difference image	Image prepared by subtracting the digital values of pixels in one image from those in a second image to produce a third set of pixels. This third set is used to form the difference image.
Diffuse reflector	Surface that reflects incident radiation nearly equally in all directions.
Digital display	A form of data display in which values are shown as arrays of numbers.
Digital image	An image where the property being measured has been converted from a continuous range of analogue values to a range expressed by a finite number of integers, usually recorded as binary codes from 0 to 255, or as one byte.
Digital image processing	Computer manipulation of the digital-number values of an image.
Digital number (DN)	Value assigned to a pixel in a digital image.
Digitization	Process of converting an analog display into a digital display.
Digitizer	Device for scanning an image and converting it into numerical format.
Directional filter	Mathematical filter designed to enhance on an image those linear features oriented in a particular direction.
Distortion	On an image, changes in shape and position of objects with respect to their true shape and position.
Diurnal	Daily.
DLG--Digital Line Graph	A DLG is line map information in digital form. The DLG data files include information about planimetric base categories, such as transportation, hydrography, and boundaries.
DMA--Defense Mapping Agency	The DMA was established in 1972, when mapping, charting, and geodesy functions of the Defense Community were combined into this joint Department of Defense agency. The mission of the Agency is to: produce and distribute to the Joint Chiefs of Staff, unified and specified commands, military departments, and other department of defense users, timely and uniquely tailored mapping, charting, and geodetic products, services, and training; provide nautical charts and marine navigational data to worldwide merchant marine and private vessel operators; and maintain liaison with civil agencies and other national and international scientific and other organizations engaged in mapping, charting, and geodetic activities. The above activities were handled by the DMA Combat Support Center until the Center was disbanded in 1995 and responsibilities were transferred to the National Imagery Mapping Agency (NIMA)
Doppler principle	Describes the change in observed frequency that electromagnetic or other waves undergo as a result of the movement of the source of waves relative to the observer.

Doppler radar	The weather radar system that uses the Doppler shift of radio waves to detect air motion that can result in tornadoes and precipitation, as previously-developed weather radar systems do. It can also measure the speed and direction of rain and ice, as well as detect the formation of tornadoes sooner than older radars.
Doppler shift	A change in the observed frequency of EM or other waves caused by the relative motion between source and detector. Used principally in the generation of synthetic-aperture radar images.
DOQQ	Digital ortho-quarter quadrangle
Drainage Basin	Geographic area or region containing one or more drainage areas that discharge run-off to a single point.
DTM--Digital Terrain Model	A DTM is a land surface represented in digital form by an elevation grid or lists of three-dimensional coordinates.
Dwell time	Time required for a detector IFOV to sweep across a ground resolution cell.

E

Earth Observing System (EOS)	A series of small- to intermediate-sized spacecraft that is the centerpiece of NASA's Mission to Planet Earth (MTPE). Planned for launch beginning in 1998, each of each of the EOS spacecraft will carry a suite of instruments designed to study global climate change. MTPE will use space-, aircraft-, and ground-based measurements to study our environment as an integrated system. Designing and implementing the MTPE is, of necessity, an international effort. The MTPE program involves the cooperation of the U.S., the European Space Agency (ESA), and the Japanese National Space Development Agency (NASDA). The MTPE program is part of the U.S. interagency effort, the Global Change Research Program.
EDAC--Earth Data Analysis Center	EDAC, also known as the Technology Applications Center (TAC), has served as a NASA center since 1964. EDAC operates under the objective of transferring Earth-observing technologies to the user community. It supports and works directly with industries developing technologies related to space science and collaborating with them to enhance and encourage the user community to adopt the new technologies. EDAC also supports and works with public agencies, private citizens, educational organizations, and volunteer groups to ensure ready accessibility to NASA generated space imagery.
EDC	EROS Data Center.
Edge	A boundary in an image between areas with different tones.
Edge enhancement	Image-processing technique that emphasizes the appearance of edges and lines.
Ektachrome	A Kodak color positive film.
Electromagnetic radiation	Energy propagated in the form of and advancing interaction between electric and magnetic fields. All electromagnetic radiation moves at the speed of light.
Electromagnetic spectrum	Continuous sequence of electromagnetic energy arranged according to wavelength or frequency.

El Niño	A warming of the surface waters of the eastern equatorial Pacific that occurs at irregular intervals of 2-7 years, lasting 1-2 years. Along the west coast of South America, southerly winds promote the upwelling of cold, nutrient-rich water that sustains large fish populations that sustain abundant sea birds, whose droppings support the fertilizer industry. Near the end of each calendar year, a warm current of nutrient-pool tropical water replaces the cold, nutrient-rich surface water. Because this condition often occurs around Christmas, it was named El Niño (Spanish for boy child, referring to the Christ child). In most years the warming last only a few weeks or a month, after which the weather patterns return to normal and fishing improves. However, when El Niño conditions last for many months, more extensive ocean warming occurs and economic results can be disastrous. El Niño has been linked to wetter, colder winters in the United States; drier, hotter summers in South America and Europe; and drought in Africa. See ENSO.
Emission	Process by which a body radiates electromagnetic energy. Emission is determined by kinetic temperature and emissivity.
Emissivity (e)	Ratio of radiant flux from a body to that from a blackbody at the same kinetic temperature and emissivity.
Emittance	A term for the radiant flux of energy per unit area emitted by a body. (Now obsolete).
Emulsion	Suspension of photosensitive silver halide grains in gelatin that constitutes the image-forming layer on photographic film.
Energy flux	Radiant flux.
Enhancement	Process of altering the appearance of an image so that the interpreter can extract more information.
ENSO (El Niño-Southern Oscillation)	Interacting parts of a single global system of climate fluctuations. ENSO is the most prominent known source of interannual variability in weather and climate around the world, though not all areas are affected. The Southern Oscillation (SO) is a global-scale seesaw in atmospheric pressure between Indonesia/North Australia, and the southeast Pacific. In major warm events El Niño warming extends over much of the tropical Pacific and becomes clearly linked to the SO pattern. Many of the countries most affected by ENSO events are developing countries with economies that are largely dependent upon their agricultural and fishery sectors as a major source of food supply, employment, and foreign exchange. New capabilities to predict the onset of ENSO event can have a global impact. While ENSO is a natural part of the Earth's climate, whether its intensity or frequency may change as a result of global warming is an important concern.
EOSAT	The commercial company that took over operations of the Landsat system in 1985.
Ephemeris	A table of predicted satellite orbital locations for specific time intervals. The ephemeris data help to characterize the conditions under which remotely sensed data are collected and are commonly used to correct the sensor data prior to analysis.
ERBSS	Earth Radiation Budget Sensor System, carried by NOAA satellites.
EREP	Earth Resources Experiment Package, carried on Skylab and consisting of cameras and multispectral scanner.
EROS	Earth Resources Observation System.
EROS Data Center (EDC)	Facility of the U.S. Geological Survey at Sioux Falls, South Dakota, that archives, processes, and distributes images.
ERTS	Earth Resource Technology Satellite, now called Landsat.
ESA	European Space Agency, based in Paris. A consortium between several European states for the development of space science, including the launch of remote-sensing satellites.

ETC	Earth-terrain camera.
Evaporative cooling	Temperature drop caused by evaporation of water from a moist surface.
Exitance	The radiant flux.
F	
False color image	A color image where parts of the non-visible EM spectrum are expressed as one or more of the red, green, and blue components, so that the colors produced by the Earth's surface do not correspond to normal visual experience. Also called a false-color composite (FCC). The most commonly seen false-color images display the very-near infrared as red, red as green, and green as blue.
False color photograph	Another term for IR color photograph.
Far range	The portion of a radar image farthest from the aircraft or spacecraft flight path.
Fiducial Marks	A set of four marks located in the corners or edge-centered, or both, of a photographic image. These marks are exposed within the camera onto the original film and are used to define the frame of reference for spatial measurements on aerial photographs. Opposite fiducial marks connected, intersect at approximately the image center of the aerial photograph.
Film	Light-sensitive photographic emulsion and its base.
Film speed	Measure of the sensitivity of photographic film to light. Larger numbers indicate higher sensitivity.
Film Types	Photographic products for use in image interpretation are commonly generated from the following film types: <ul style="list-style-type: none"> • Black-and-White Panchromatic (B&W): This film primarily consists of a black-and-white negative material with a sensitivity range comparable to that of the human eye. It has good contrast and resolution with low graininess and a wide exposure range. • Black-and-White Infrared (BIR): With some exceptions, this film is sensitive to the spectral region encompassing 0.4 <u>micrometers</u> to 0.9 micrometers. It is sometimes referred to as near-infrared film because it utilizes only a narrow portion of the total infrared spectrum (0.7 micrometers to 0.9 micrometers). • Conventional Color: This film contains three emulsion layers that are sensitive to blue, green, and red (the three primary colors of the visible spectrum). This film replicates colors as seen by the human eye and is commonly referred to as normal or natural color. Color film is a valuable image interpretation tool because the human eye can discern a greater variety of color tones than gray tones. • Color Infrared (CIR): This film, originally referred to as camouflage-detection film because of its warfare applications, differs from conventional color film because its emulsion layers are sensitive to green, red, and near-infrared radiation (0.5 micrometers to 0.9 micrometers). Used with a yellow filter to absorb the blue light, this film provides sharp images and penetrates haze at high altitudes. Color-infrared film also is referred to as false-color film.
Filter, optical	Mathematical procedure for modifying values of numerical data. A material that, by absorption or reflection, selectivity modifies the radiation transmitted through an optical system.

Flight path	Line on the ground directly beneath a remote sensing aircraft or spacecraft. Also called flight line.
Fluorescence	Emission of light from a substance following exposure to radiation from an external source.
F-number	Representation of the speed of a lens determined by the focal length divided by diameter of the lens. Smaller numbers indicate faster lenses.
Focal length	In cameras, the distance from the optical center of the lens to the plane at which the image of a very distant object is brought into focus.
Foreshortening	A distortion in radar images causing the lengths of slopes facing the antenna to appear shorter on the image than on the ground. It is produced when radar wave fronts are steeper than the topographic slope.
Format	Size of an image
Forward overlap	The percent of duplication by successive photographs along a flight line.
Fovea	The region around that point on the retina intersected by the eye's optic axis, where receptors are most densely packed. It is the most sensitive part of the retina.
Frequency (v)	The number of wave oscillations per unit time or the number of wavelengths that pass a point per unit time.
F-stop	Focal length of a lens divided by the diameter of the lens's adjustable diaphragm. Smaller numbers indicate larger openings, which admit more light to the film.
G	
GAC--Global Area Coverage	GAC data are derived from a sample averaging of the full resolution AVHRR data. Four out of every five samples along the scan line are used to compute one average value and the data from only every third scan line are processed, yielding 1.1 km by 4 km resolution at the subpoint.
Gamma	This is a unit of magnetic intensity.
GCP	Ground-control point. GCPs are physical points on the ground whose positions are known with respect to some horizontal coordinate system and/or vertical datum. When mutually identifiable on the ground and on a map or photographic image, ground control points can be used to establish the exact spatial position and orientation of the image to the ground. Ground control points may be horizontal control points, vertical control points, or both.
Gemini	U.S. program of two-man earth-orbiting spacecraft in 1965 and 1966.
Geodetic	Of or determined by geodesy; that part of applied mathematics which deals with the determination of the magnitude and figure either of the whole Earth or of a large portion of its surface. Also refers to the exact location points on the Earth's surface.
Geodetic accuracy	The accuracy with which geographic position and elevation of features on the Earth's surface are mapped. This accuracy incorporates information in which the size and shape of the Earth has been taken into account.
Geographic information system (GIS)	A data-handling and analysis system based on sets of data distributed spatially in two dimensions. The data sets may be map oriented, when they comprise qualitative attributes of an area recorded as lines, points, and areas often in vector format, or image oriented, when the data are quantitative attributes referring to cells in a rectangular grid usually in raster format. It is also known as a geobased or geocoded information system.
Geometric correction	Image-processing procedure that corrects spatial distortions in an image.

Georegistered	An image that has been geographically referenced or rectified to an Earth model, usually to a map projection. Sometimes referred to as geocoded or geometric registration.
Geostationary	Refers to satellites traveling at the angular velocity at which the earth rotates; as a result, they remain above the same point on earth at all times.
Geostationary Operational Environmental Satellite (GOES)	<p>a NOAA satellite that acquires visible and thermal IR images for meteorological purposes such as:</p> <ul style="list-style-type: none"> • Provide continuous day and night weather observations; • Monitor severe weather events such as hurricanes, thunderstorms, and flash floods; • Relay environmental data from surface collection platforms to a processing center; • Perform facsimile transmissions of processed weather data to low-cost receiving stations; • Monitor the Earth's magnetic field, the energetic particle flux in the satellite's vicinity, and x-ray emissions from the sun; • Detect distress signals from downed aircraft and ships. <p>points 35,790 km (22,240 miles) above the equator at 75 degrees west and 135 degrees west. GOES satellites have an equatorial, Earth-synchronous orbit with a 24-hour period, a visible resolution of 1 km, an IR resolution of 4 km, and a scan rate of 1864 statute miles in three minutes. See geostationary. The transmission of processed weather data (both visible and infrared) by GOES is called weather facsimile (WEFAX). GOES WEFAX transmits at 1691+ mhz and is accessible via a ground station with a satellite dish antenna.</p> <p>GOES carries the following five major sensor systems:</p> <ol style="list-style-type: none"> 1. The imager is a multispectral instrument capable of sweeping simultaneously one visible and four infrared channels in a north-to-south swath across an east-to-west path, providing full disk imagery once every thirty minutes. 2. The sounder has more spectral bands than the imager for producing high quality atmospheric profiles of temperature and moisture. It is capable of stepping one visible and eighteen infrared channels in a north-to-south swath across an east-to-west path. 3. The Space Environment Monitor (SEM) measures the condition of the Earth's magnetic field, the solar activity and radiation around the spacecraft, and transmits these data to a central processing facility. 4. The Data Collection System (DCS) receives transmitted meteorological data from remotely located platforms and relays the data to the end-users. 5. The Search and Rescue Transponder can relay distress signals at all times, but cannot locate them. While only the polar-orbiting satellite can locate distress signals, the two types of satellites work together to create a comprehensive search and rescue system.
Geostationary orbit	An orbit at 41 000 km in the direction of the Earth's rotation, which matches speed so that a satellite remains over a fixed point on the Earth's surface.
Geosynchronous (aka GEO)	geostationary.

Geothermal	Refers to heat from sources within the earth.
Goddard Space Flight Center (GSFC)	The NASA facility at Greenbelt, Maryland, that is also a Landsat ground receiving station.
GMT	Greenwich mean time. This international 24-h system is used to designate the time at which Landsat images are acquired.
GOES	
Gossan	Surface occurrence of iron oxide formed by the weathering of metallic sulfide ore minerals.
GPS--Global Positioning System	The GPS is a worldwide satellite navigation system that is funded and supervised by the U.S. Department of Defense. GPS satellites transmit specially coded signals. These signals are processed by a GPS receiver that computes extremely accurate measurements, including 3-dimensional position, velocity, and time on a continuous basis
Granularity	Graininess of developed photographic film that is determined by the texture of the silver grains.
GRASS--Geographic Resources Analysis Support System	GRASS is a product of the U.S. Army Corps of Engineers Construction Engineering Research Laboratories (USACERL) in Champaign, Illinois. It is an integrated set of programs designed to provide digitizing, image processing, map production, and geographic information system capabilities to its users.
Gray scale	A sequence of gray tones ranging from black to white.
Grid format	irregularly distributed points, or along survey lines, to values referring to square cells in a rectangular array. It forms a step in the process of contouring data, but can also be used as the basis for a raster format to be displayed and analyzed digitally after the values have been rescaled to the 0-255 range.
Ground-control point	A geographic feature of known location that is recognizable on images and can be used to determine geometric corrections.
Ground range	On radar images, the distance from the ground track to an object.
Ground-range image	Radar image in which the scale in the range direction is constant.
Ground receiving station	
Ground resolution cell	Area on the terrain that is covered by the IFOV of a detector.
Ground swath	Width of the strip of terrain that is imaged by a scanner system.
GSFC	Goddard Space Flight Center
H	
	Refers to waves in which the component frequencies are whole-number multiples of the fundamental frequency.
HCMM	Heat Capacity Mapping Mission, the NASA satellite launched in 1978 to observe thermal properties of rocks and soils. It remained in orbit for only a few months.
Heat capacity-(c)	temperature rise or fall. Expressed in calories per gram per degree centigrade. Also called thermal capacity.
Heat Capacity Mapping Mission (HCMM)	NASA satellite orbited in 1978 to record daytime and nighttime visible and thermal IR images of large areas.
Highlights	
High-pass filter	A spatial filter that selectively enhances contrast variations with high spatial frequencies in an image. It improves the sharpness of images and is a method of edge enhancement.
HIRIS-High Resolution Imaging Spectrometer	Possibly to be carried by the Space Shuttle.
HIRS-High Resolution Infrared Spectrometer	Carried by NOAA satellites.

Histogram	A means of expressing the frequency of occurrence of values in a data set within a series of equal ranges or bins, the height of each bin representing the frequency at which values in the data set fall within the chosen range. A cumulative histogram expresses the frequency of all values falling within a bin and lower in the range. A smooth curve derived mathematically from a histogram is termed the probability density function (PDF).
HORIZONTAL POLARIZATION	Transmission of microwaves so that the electric lines of force are horizontal, while the magnetic lines of force are vertical.
HRPT--High Resolution Picture Transmission	HRPT data are full resolution image data transmitted to a ground station as they are collected. The average instantaneous field-of-view of 1.4 milliradians yields a HRPT ground resolution of approximately 1.1 km at the satellite nadir from the nominal orbit altitude of 833 km (517 mi).
HRV--High Resolution Visible Imaging Instrument	The HRV instrument is a multispectral radiometer designed for SPOT spacecraft. The HRV instrument provides for high-resolution imaging in the visible and near-infrared portions of the electromagnetic spectrum. The first three SPOT satellites carry twin HRVs that operate in a number of viewing configurations and in different spectral modes. Some of those viewing configurations and spectral modes include one HRV only operating in a dual spectral mode (i.e., in both panchromatic mode and multispectral mode); two HRVs operating in the twin-viewing configuration (i.e., one HRV in panchromatic mode and one HRV in multispectral mode); and two HRVs operating independently of each other (i.e., not in twin-viewing configuration).
Hue	In the IHS system, represents the dominant wavelength of a color.
HYDROLOGY	Scientific study of the waters of the Earth, especially with relation to the effects of precipitation and evaporation upon the occurrence and character of ground water.
HYPSOGRAPHY	level, especially the measurement and mapping of land elevation.
I	
IFOV	Instantaneous field of view.
IHS	Intensity, hue, and saturation system of colors.
Image	Pictorial representation of a scene recorded by a remote sensing system. Although image is a general term, it is commonly restricted to representations acquired by non-photographic methods.
Image dissection	The breaking down of a continuous scene into discrete spatial elements, either by the receptors on the retina, or in the process of capturing the image artificially.
Image striping	A defect produced in line scanner and push-broom imaging devices produced by the non-uniform response of a single detector, or amongst a bank of detectors. In a line-scan image the stripes are perpendicular to flight direction, but parallel to it in a push-broom image.
Image swath	See ground swath.
Incidence angle	In radar, the angle formed between an imaginary line normal to the surface and another connecting the antenna and the target.
Incident energy	Electromagnetic radiation impinging on a surface.

Index of refraction (n)	Ratio of the wavelength or velocity of electromagnetic radiation in a vacuum to that in a substance.
Instantaneous field of view (IV or IFOV)	Solid angle through which a detector is sensitive to radiation. In a scanning system, the solid angle subtended by the detector when the scanning motion is stopped.
Intensity	In the IHS system, brightness ranging from black to white.
Interactive processing	results and can alter the instructions to the computer to achieve desired results.
Interpretation	The process in which a person extracts information from an image.
Interpretation key	interpreter to identify an object on an image.
IR	Infrared region of the electromagnetic spectrum that includes wavelengths from 0.7 μ m to 1 mm.
IR color photograph	Color photograph in which the red-imaging layer is sensitive to photographic IR wavelengths, the green-imaging layer is sensitive to red light, and the blue-imaging layer is sensitive to green light. Also known as camouflage detection photographs and false-color photographs.
ISO index	Index of the International Standards Organization, designating film speed in photography. Higher values indicate higher sensitivity.
Isotherm	Contour line connecting points of equal temperature. Isotherm maps are used to portray surface-temperature patterns of water bodies.
J	
Japanese National Space Development Agency (NASDA)	The agency reports to the Japanese Ministry of Science and Technology.
JNC--Jet Navigation Chart	The JNC series provides worldwide coverage at a scale of 1:2,000,000. The information on these charts are suitable for aeronautical long-range, high-altitude, high-speed travel; map features include cities, roads, railroads, lakes, principal drainage, and permanent snow/ice areas. The polar regions are in a Transverse Mercator projection. All other regions are presented in the Lambert Conformal Conic projection.
Johnson Space Flight Center	A NASA facility in Houston, Texas.
JPL	Jet Propulsion Laboratory, a NASA facility at Pasadena, California, operated under contract by the California Institute of Technology.
K	
Ka band	Radar wavelength region from 0.8 to 1.1 cm.
Kelvin Units	A Kelvin Unit refers to a thermometric scale in which the degree intervals are equal to those of the Celsius scale and in which zero (0) degrees equals -273.15 degrees Celsius (absolute zero)
Kernel	Two-dimensional array of digital numbers used in digital filtering.
Kinetic energy	The ability of a moving body to do work by virtue of its motion. The molecular motion of matter is a form of kinetic energy.
Kinetic temperature	Internal temperature of an object determined by random molecular motion. Kinetic temperature is measured with a contact thermometer.
Kodachrome	A Kodak color positive film.
L	
LAC--Local Area	LAC are full resolution data recorded on an onboard tape recorder for

Coverage	subsequent transmission during a station overpass. The average instantaneous field-of-view of 1.4 milliradians yields a LAC ground resolution of approximately 1.1 km at the satellite nadir from the nominal orbit altitude of 833 km.
LACIE	Large Area Crop Inventory Experiment
Lambert Azimuthal Equal Area Projection	Azimuthal projections are formed onto a plane, which is usually tangent to the globe at either pole, the Equator, or any intermediate point. The Lambert Azimuthal Equal Area projection is a method of projecting maps on which the azimuth or direction from a given central point to any other point is shown correctly and also on which the areas of all regions are shown in the same proportion of their true areas. When a pole is the central point, all meridians are spaced at their true angles and are straight radii of concentric circles that represent the parallels. This projection is frequently used in one of three aspects: The polar aspect is used in atlases for maps of polar regions and of the Northern and Southern Hemispheres; the equatorial aspect is commonly used for atlas maps of the Eastern and Western Hemispheres; and the oblique aspect is used for atlas maps of continents and oceans.
Lambert Conformal Conic Projection	<p>The Lambert Conformal Conic Projection is derived by the projection of lines from the center of the globe onto a simple cone. This cone intersects the Earth along two standard parallels of latitude, both of which are on the same side of the equator. All meridians are converging straight lines that meet at a common point beyond the limits of the map. Parallels are concentric circles whose center is at the intersection point of the meridians. Parallels and meridians cross at right angles, an essential of conformality.</p> <p>chosen to enclose two-thirds of the north to south map area. Between these parallels, the scale will be too small, and beyond them, too large. If the north to south extent of the mapping is limited, maximum scale errors will rarely exceed one percent. Area exaggeration between and near the standard parallels, is very slight; thus, the projection provides good directional and shape relationships for areas having their long axes running in an east to west belt.</p>
LANDSAT (formerly ERTS)	The Landsat program, first known as the Earth Resources Technology Satellite (ERTS) Program, is a development of the National Aeronautics and Space Administration (NASA) in association with NOAA, USGS, and the Space Imaging. The activities of these combined groups led to the concept of dedicated Earth-orbiting satellites, the defining of spectral and spatial requirements for their instruments, and the fostering of research to determine the best means of extracting and using information from the data. The first satellite, ERTS 1, was launched on 7/23/72. The second satellite was launched on 1/22/75. Concurrently the name of the satellites and program was changed to emphasize its prime area of interest (land resources). The first two satellites were designated as Landsats 1 and 2. Landsat 3 was launched on 3/5/78. Landsat 4 was launched on 7/16/82. Landsat 5 (launched 3/1/84) is currently in service providing selected data to worldwide researchers.
Laplacian filter	A form of nondirectional digital filter.
Large-format camera (LFC)	An experiment first carried on the Space Shuttle in October 1984.
Laser	Light artificially stimulated electromagnetic radiation: a beam of coherent radiation with a single wavelength.
Latitude (aka the geodetic latitude)	The angle between a perpendicular at a location, and the equatorial plane of the Earth.

Latent image	Invisible image produced by the photochemical effect of light on silver halide grains in the emulsion of film. The latent image is not visible until after photographic development.
Layover	In radar images, the geometric displacement of the objects toward the near range relative to their base.
L band	
Lens	One or more pieces of glass or other transparent material shaped to form an image by refraction of light.
LEVEL 1b	discrete data sets and to which Earth location and calibration information have been appended, but not applied.
LFC	<p>Large-format camera. The LFC was a high altitude aerial mapping camera scaled up to operate from the Space Shuttle in Earth-orbital altitudes. LFC specifications included:</p> <ul style="list-style-type: none"> • Film Format Size: 9 x 18 inches (23 x 46 cm) • Lens Aperture: F/6.0 -Lens Focal Length: 12 inches (30.5 cm) • Exposure Interval: 7.5 sec. • Exposure Range: 1/250 to 1/31.25 seconds • Ground Resolution: 20 meters at 160 nautical miles • Ground Coverage: 120 x 240 nautical miles at 160 nm
	Light intensity detection and ranging, which uses lasers to stimulate fluorescence in various compounds and to measure distances to reflecting surfaces.
Light	Electromagnetic radiation ranging from 0.4 to 0.7 μ m in wavelength that is detectable by the human eye.
Light meter	Device for measuring the intensity of visible radiation and determining the appropriate exposure of photographic film in a camera.
Lineament	Linear topographic or tonal feature on the terrain and on images, maps, and photographs that may represent a zone of structural weakness.
Linear	Adjective that describes the straight line-like nature of features on the terrain or on images and photographs.
Lineation	The one-dimensional alignment of internal components of a rock that cannot be depicted as an individual feature on a map.
Line drop out	The loss of data from a scan line caused by malfunction of one of the detectors in a line scanner.
Line-pair	Pair of light and dark bars of equal widths. The number of such line-pairs aligned side by side that can be distinguished per unit distance expresses the resolving power of an imaging system.
Line scanner	An imaging device, which uses a mirror to sweep the ground surface normal to the flight path of the platform. An image is built up as a strip comprising lines of data.
Look angle	The angle between the vertical plane containing a radar antenna and the direction of radar propagation. Complementary to the depression angle.
Look direction	Direction in which pulses of microwave energy are transmitted by a radar system. The look direction is normal to the azimuth direction. Also called range direction.
Look-up table (LUT)	A mathematical formula used to convert one distribution of data to another, most conveniently remembered as a conversion graph.
Longitude	The angular distance from the Greenwich meridian (0 degree), along the equator. This can be measured either east or west to the 180th meridian (180 degrees) or 0 degree to 360 degrees W.
Low-sun-angle photograph	Aerial photograph acquired in the morning, evening, or winter when the sun is at a low elevation above the horizon.

Luminance	Quantitative measure of the intensity of light from a source.
Mach band	An optical illusion of dark and light fringes within adjacent areas of contrasted tone. It is a psychophysiological phenomenon, which aids human detection of boundaries or edges.
Median filter	A spatial filter, which substitutes the median value of DN from surrounding pixels for that recorded at an individual pixel. It is useful for removing random noise.
Mercator Projection	Mercator is a conformal map projection, that is, it preserves angular relationships. Mercator was designed and is recommended for navigational use and is the standard for marine charts. Mercator is often and inappropriately used as a world map projection in atlases and for wall charts where it presents a misleading view of the world because of the excessive distortion of area in the higher latitude areas.
Mercury	U.S. program of one-man, earth-orbiting spacecraft in 1962 and 1963.
Microwave	Region of the electromagnetic spectrum in the wavelength range of 0.1 to 30 cm.
Mid-infrared (MIR)	The range of EM wavelengths from 8 to 14 μm dominated by emission of thermally generated radiation from materials; also known as thermal infrared.
Mie scattering	The scattering of EM energy by particles in the atmosphere with comparable dimensions to the wavelength involved.
Minimum ground separation	Minimum distance on the ground between two targets at which they can be resolved on an image.
Minus-blue photographs	Black-and-white photographs acquired using a filter that removes blue wavelengths to produce higher spatial resolution.
Mixed pixel	A pixel whose DN represents the average energy reflected or emitted by several types of surface present within the area that it represents on the ground; sometimes called a mixel.
Modular optoelectric multispectral scanner (MOMS)	An along-track scanner carried on the Space Shuttle that recorded two bands of data.
Modulate	To vary the frequency, phase, or amplitude of electromagnetic waves.
Modulation transfer function (MTF)	A method of describing spatial resolution.
MOMS	Modular optoelectric multispectral scanner.
MOS-1	Marine Observation Satellite, launched by Japan in 1987.
Mosaic	Composite image or photograph made by piecing together individual images or photographs covering adjacent areas.
MSS	Multispectral scanner system of Landsat that acquires images of four wavelength bands in the visible and reflected IR regions.
Multiband camera	System that simultaneously acquires photographs of the same scene at different wavelengths.
Multispectral classification	Identification of terrain categories by digital processing of data acquired by multispectral scanners.
Multispectral scanner	Scanner system that simultaneously acquires images of the same scene at different wavelengths.
N	
NAD27--North American Datum of 1927	NAD27 is defined with an initial point at Meads Ranch, Kansas, and by the parameters of the Clarke 1866 ellipsoid. The location of features on USGS topographic maps, including the definition of 7.5-minute quadrangle corners, are referenced to the NAD27.

NAD83--North American Datum of 1983	NAD83 is an Earth-centered datum and uses the Geodetic Reference System 1980 (GRS 80) ellipsoid, unlike NAD27, which is based on an initial point (Meade's Ranch, Kansas). Using recent measurements with modern geodetic, gravimetric, astrodynamic, and astronomic instruments, the GRS 80 ellipsoid has been defined as a best fit to the worldwide geoid. Because the NAD83 surface deviates from the NAD27 surface, the position of a point based on the two reference datums will be different.
Nadir	Point on the ground directly in line with the remote sensing system and the center of the earth.
NAPP--National Aerial Photography Program	NAPP was established to coordinate the collection of aerial photography covering the 48 contiguous States and Hawaii every five years. NAPP's goals are to ensure that photography with uniform scale, quality, and cloud-free coverage be made available to meet the requirements of several Federal and State agencies. The program was initiated in 1980 as the National High Altitude Photography (NHAP) program. In 1987, the program was renamed to NAPP when the flying height for the program changed from 40,000 feet to 20,000 feet. NAPP photography is available in black and white, and in most cases, color-infrared. The program is administered by the U.S. Geological Survey's National Mapping Division. NAPP imagery is used by the USGS for photo revision and land use land cover characterization work on the standard series maps at 1:24,000; 1:100,000 and 1:250,000 scales.
NASA	National Aeronautical and Space Administration.
NDVI--Normalized Difference Vegetation Index	index, i.e., the difference between Channel 2 and 1) and the sum of Channels 2 and 1. Thus $NDVI = (channel\ 2 - channel\ 1) / (channel\ 2 + channel\ 1)$.
Nearest Neighbor Resampling	When correcting image data points, the nearest neighbor technique assigns for each new pixel that pixel value which is closest in relative location to the newly computed pixel location.
Near infrared (NIR)	The shorter wavelength range of the infrared region of the EM spectrum, from 0.7 to 2.5 μm . It is often divided into very-near infrared (VNIR) covering the range accessible to photographic emulsions (0.7 to 1.0 μm), and the short-wavelength infrared (SWIR) covering the remainder of the NOR atmospheric window from 1.0 to 2.5 μm .
Near range	Refers to the portion of a radar image closest to the aircraft or satellite flight path.
Negative photograph	Photograph on film or paper in which the relationship between bright and dark tones is the reverse of that of the features on the terrain.
NESDIS--National Environmental Satellite, Data and Information Service	NESDIS is the element in NOAA that is responsible for establishing a digital archive of data collected from the current generation of NOAA operational polar orbiting satellites
NHAP	National High Altitude Photography program of the U.S. Geological Survey.
NOAA	National Oceanic and Atmospheric Administration.
Noise	Random or repetitive events that obscure or interfere with the desired information.
Nondirectional filter	Mathematical filter that treats all orientations of linear features equally.
Non-selective scattering	The scattering of EM energy by particles in the atmosphere which are much larger than the wavelengths of the energy, and which causes all wavelengths to be scattered equally.
Non-spectral hue	A hue which is not present in the spectrum of colors produced by the analysis of white light by a prism of diffraction grating. Examples are brown, magenta, and pastel shades.

Nonsystematic distortion	Geometric irregularities on images that are not constant and cannot be predicted from the characteristics of the imaging system.
Normal color film	Film in which the colors are essentially true representations of the colors of the terrain.
NSSDC	National Space Science Data Center.
O	
Oasis	A spot in a desert made fertile by water, which normally originates as groundwater.
Oblique photograph	Photograph acquired with the camera intentionally directed at some angle between horizontal and vertical orientations.
OMS	Orbital maneuvering system.
ONC--Operational Navigation Chart	The ONC series covers most of the world landmass areas at 1:1,000,000 scale. At this scale it takes 62 charts to cover the conterminous United States. Information on these charts includes cities and landmarks, drainage, and relief (shown by shading and contours). International and State boundaries are shown, but not county boundaries.
Orbit	Path of a satellite around a body such as the earth, under the influence of gravity.
Orthophotograph	A vertical aerial photograph from which the distortions due to varying elevation, tilt, and surface topography have been removed, so that it represents every object as if viewed directly from above.
Orthophotoscope	An optical-electronic device, which converts a normal vertical aerial photograph to an orthophotograph.
Ortho-correction	Correction applied to satellite imagery to account for terrain-induced distortion.
Overlap	Extent to which adjacent images or photographs cover the same terrain, expressed as a percentage.
P	
Panchromatic film	
Parallax	Displacement of the position of a target in an image caused by a shift in the observation system.
Parallax difference	between two points, which represent two locations on the ground with different elevations.
Parallel-polarized	Describes a radar pulse in which the polarization of the return is the same as that of the transmission. Parallel-polarized images may be HH (horizontal transmit, horizontal return) or VV (vertical transmit, vertical return).
Pass	In digital filters, refers to the spatial frequency of data transmitted by the filter. High-pass filters transmit high-frequency data; low-pass filters transmit low-frequency data.
Passive microwaves	Radiation in the 1 mm to 1 m range emitted naturally by all materials above absolute zero.
Passive remote sensing	terrain.
Path-and-row index	System for locating Landsat MSS and TM images.
Pattern	Regular repetition of tonal variations on an image or photograph.
Periodic line dropout	Defect on Landsat MSS or TM images in which no data are recorded for every sixth or sixteenth scan line, causing a black line on the image.

Periodic line striping	Defect on Landsat MSS or TM images in which every sixth or sixteenth scan line is brighter or darker than the others. Caused by the sensitivity of one detector being higher or lower than the others.
Photodetector	Device for measuring energy in the visible-light band.
Photogeology	Mapping and interpretation of geologic features from aerial photographs.
Photograph-	Representation of targets on film that results from the action of light on silver halide grains in the film's emulsion.
Photographic IR	Short-wavelength portion (0.7 to 0.9 μm) of the IR band that is detectable by IR color film or IR black-and-white film.
Photographic UV	Long-wavelength portion of the UV band (0.3 to 0.4 μm) that is transmitted through the atmosphere and is detectable by film.
Photomosaic	Mosaic composed of photographs.
Photon	Minimum discrete quantity of radiant energy.
Photopic vision	Vision under conditions of bright illumination.
Picture element	In a digitized image, the area on the ground represented by each digital number. Commonly contracted to pixel.
Pitch	Rotation of an aircraft about the horizontal axis normal to its longitudinal axis that causes a nose-up or nose-down attitude.
Pixel	Contraction of picture element.
Planck's Law	An expression for the variation of emittance of a blackbody at a particular temperature as a function of wavelength.
Point spread function (PSF)	The image of a point source of radiation, such as a star, collected by an imaging device. A measure of the spatial fidelity of the device.
Polarization	The direction of orientation in which the electrical field vector of electromagnetic radiation vibrates.
Polar orbit	An orbit that passes close to the poles, thereby enabling a satellite to pass over most of the surface, except the immediate vicinity of the poles themselves.
Polarized radiation	Electromagnetic radiation in which the electrical field vector is contained in a single plane, instead of having random orientation relative to the propagation vector. Most commonly refers to radar images.
Positive photograph	Photographic image in which the tones are directly proportional to the terrain brightness.
Precision	<p>Precision is a statistical measurement of repeatability that is usually expressed as a variance or standard deviation, root mean square or <u>RMS</u>, of repeated measurements. These are expressed as x, y coordinates of arcs, label points, and tics in either single or double precision in ARC/INFO.</p> <p>Single-precision coordinates have up to seven significant digits of precision. This allows for a level of accuracy of approximately 10 meters for a region whose extent is 1,000,000 meters across. Double-precision coordinates have up to 15 significant digits; this allows for the precision necessary to represent any desired map accuracy at a global scale.</p>
Previsual symptom	A vegetation anomaly that is recognizable on IR film before it is visible to the naked eye or on normal color photographs. It results when stressed vegetation loses its ability to reflect photographic IR energy and is recognizable on IR color film by a decrease in brightness of the red hues.
Primary colors	A set of three colors that in various combinations will produce the full range of colors in the visible spectrum. There are two sets of primary colors, additive and subtractive.
Principal component analysis	The analysis of covariance in a multiple data set so that the data can be projected as additive combinations on to new axes, which express different kinds of correlation among the data.

Principal-component (PC) image	Digitally processed image produced by a transformation that recognizes maximum variance in multispectral images.
Principal point	Optical center of an aerial photograph.
Printout	Display of computer data in alphanumeric format.
Probability density function (PDF)	A function indicating the relative frequency with which any measurement may be expected to occur. In remote sensing it is represented by the histogram of DN in one band for a scene.
Projection	Orderly system of lines on a plane representing a corresponding system of imaginary lines on an adopted terrestrial or celestial datum surface. Also, the mathematical concept of such a system. For maps of the Earth, a projection consists of (1) a graticule of lines representing parallels of latitude and meridians of longitude or (2) a grid.
Pulse	Short burst of electromagnetic radiation transmitted by a radar antenna.
Pulse length	Duration of a burst of energy transmitted by a radar antenna, measured in microseconds.
Pushbroom scanner	An alternate term for an along-track scanner
Pushbroom system	An imaging device consisting of a fixed linear array of many sensors, which is swept across an area by the motion of the platform, thereby building up an image. It relies on sensors whose response and reading is nearly instantaneous, so that the image swathe can be segmented into pixels representing small dimensions on the ground.
Quantum	The elementary quantity of EM energy that is transmitted by a particular wavelength. According to the quantum theory, EM radiation is emitted, transmitted, and absorbed as numbers of quanta, the energy of each quantum being a simple function of the frequency of the radiation.
R	
	Acronym for radio detection and ranging. Radar is an active form of remote sensing that operates in the microwave and radio wavelength regions.
Radar altimeter	A non-imaging device that records the time of radar returns from vertically beneath a platform to estimate the distance to and hence the elevation of the surface; carried by Seasat and the EAS-ERS-1 platforms.
Radar cross section	A measure of the intensity of backscattered radar energy from a point target. Expressed as the area of a hypothetical surface, which scatters radar equally in all directions and which would return the same energy to the antenna.
Radar scattering coefficient	A measure of the back-scattered energy from a target with a large area. Expressed as the average radar cross section per unit area in decibels (db). It is the fundamental measure of the radar properties of a surface.
Radar scatterometer	terrain as a function of depression angle.
Radar shadow	Dark signature on a radar image representing no signal return. A shadow extends in the far-range direction from an object that intercepts the radar beam.
Radial relief displacement	The tendency of vertical objects to appear to lean radially away from the center of a vertical aerial photograph. Caused by the conical field of view of the camera lens.
Radian	Angle subtended by an arc of a circle equal in length to the radius of the circle 1 rad = 57.3°.

Radiance	Measure of the energy radiated by an object. In general, radiance is a function of viewing angle and spectral wavelength and is expressed as energy per solid angle.
Radiant energy peak	Wavelength at which the maximum electromagnetic energy is radiated at a particular temperature.
Radiant flux	Rate of flow of electromagnetic radiation measured in watts per square centimeter.
Radiant temperature	Concentration of the radiant flux from a material. Radiant temperature is the kinetic temperature multiplied by the emissivity to the one-fourth power.
Radiation	Propagation of energy in the form of electromagnetic waves.
Radiometer	Device for quantitatively measuring radiant energy, especially thermal radiation.
Random line dropout	In scanner images, the loss of data from individual scan lines in a nonsystematic fashion.
Range	In radar usage this is the distance in the direction of radar propagation, usually to the side of the platform in an imaging radar system. The slant range is the direct distance from the antenna to the object, whereas the distance from the ground track of the platform to the object is termed the ground range.
Range direction	See look direction.
Range resolution	In radar images, the spatial resolution in the range direction, which is determined by the pulse length of the transmitted microwave energy.
Raster	The scanned and illuminated area of a video display, produced by a modulated beam of electrons sweeping the phosphorescent screen line by line from top to bottom at a regular rate of repetition.
Raster format	A means of representing spatial data in the form of a grid of DN, each line of which can be used to modulate the lines of a video raster.
Raster pattern	Pattern of horizontal lines swept by an electron beam across the face of a CRT that constitute the image display.
Ratio image	An image prepared by processing digital multi-spectral data as follows: for each pixel, the value for one band that is divided the value of another. The resulting digital values are displayed as an image.
Rayleigh criterion	In radar, the relationship between surface roughness, depression angle, and wavelength that determines whether a surface will respond in a rough or smooth fashion to the radar pulse.
Rayleigh scattering	Selective scattering of light in the atmosphere by particle that is small compared with the wavelength of light.
RBV	Return-beam vidicon.
Real-aperture radar	Radar system in which azimuth resolution is determined by the transmitted beam width, which is in turn determined by the physical length of the antenna and by the wavelength.
Real time	Refers to images or data made available for inspection simultaneously with their acquisition.
Recognizability	Ability to identify an object on an image.
Rectilinear	Refers to images with no geometric distortion in which the scales in the horizontal and vertical directions are identical.
Redundancy	Information on an image, which is either not, required for interpretation or cannot be seen. Redundancy may be spatial or spectral. The term also refers to multispectral data where the degree of correlation between bands is so high that one band contains virtually the same information as all the bands.
Reflectance	it. Spectral reflectance is the reflectance measured within a specific wavelength interval.

Reflected energy peak	Wavelength (0.5 μm) at which maximum amount of energy is reflected from the earth's surface.
Reflected IR	consists primarily of reflected solar radiation.
Reflectivity	Ability of a surface to reflect incident energy.
Refraction	Bending of electromagnetic rays as they pass from one medium into another when each medium has a different index of refraction.
Registration	Process of superposing two or more images or photographs so that equivalent geographic points coincide.
Relief	Vertical irregularities of a surface.
Relief displacement	Geometric distortion on vertical aerial photographs. The tops of objects appear in the photograph to be radially displaced from their bases outward from the photograph's center point.
Remote sensing	Collection and interpretation of information about an object without being in physical contact with the object.
Resampling	The calculation of new DN for pixels created during geometric correction of a digital scene, based on the values in the local area around the uncorrected pixels.
Reseau marks	
Resolution	Ability to separate closely spaced objects on an image or photograph. Resolution is commonly expressed as the most closely spaced line-pairs per unit distance that can be distinguished. Also called spatial resolution.
Resolution target	Series of regularly spaced alternating light and dark bars used to evaluate the resolution of images or photographs.
Resolving power	A measure of the ability of individual components. And of remote sensing systems, to separate closely spaced targets.
Reststrahlen band	In the IR region, refers to absorption of energy as a function of silica content.
Return	In radar, a pulse of microwave energy reflected by the terrain and received at the radar antenna. The strength of a return is referred to as return intensity.
Return-beam vidicon (RBV)	a vacuum tube; the image is scanned with an electron beam and transmitted or recorded. Landsat 3 used a pair of RBV's to acquire images.
Ringling	Fringe-like artifacts produced at edges by some forms of spatial-frequency filtering.
Rods	The receptors in the retina that are sensitive to brightness variations.
Roll	Rotation of an aircraft that causes a wing-up or wing-down attitude.
Roll compensation system	Component of an airborne scanner system that measures and records the roll of the aircraft. This information is used to correct the imagery for distortion due to roll.
Rough criterion	In radar, the relationship between surface roughness, depression angle, and wavelength that determines whether a surface will scatter the incident radar pulse in a rough or intermediate fashion.
Roughness	In radar, the average vertical relief of a small-scale irregularities of the terrain surface. Also called surface roughness
RMSE (Root Mean Square Error)	The RMSE statistic is used to describe accuracy encompassing both random and systematic errors. The square of the difference between a true test point and an interpolated test point divided by the total number of test points in the arithmetic mean. The square root of this value is the root mean square error.
S	
SAMII	Stratospheric Aerosol Measurement experiment, carried by Nimbus-7.

SAMS	Stratospheric and Mesospheric Sounder, carried by Nimbus-7.
SAST (Scientific Assessment and Strategy Team)	SAST is an interdisciplinary team of senior scientists and engineers from various Federal Government agencies assigned to assess and report on the damage caused by the flood of 1993 and to provide assistance and advice to Federal officials responsible for making decisions with respect to the flood recovery in the Upper Mississippi and Missouri River basin.
Satellite	An object in orbit around a celestial body.
Saturation	In the IHS system, represents the purity of color. Saturation is also the condition where energy flux exceeds the sensitivity range of a detector.
SBUV	Solar Back-scatter Ultraviolet Instrument, carried by NOAA satellites.
Scale	Ratio of distance on an image to the equivalent distance on the ground.
Scan line	Narrow strip on the ground that is swept by IFOV of a detector in a scanning system.
Scanner	An imaging system in which the IFOV of one or more detectors is swept across the terrain.
Scanner distortion	Geometric distortion that is characteristic of cross-track scanner images.
Scan skew	Distortion of scanner images caused by forward motion of the aircraft or satellite during the time required for scanning completion.
Scattering	Multiple reflections of electromagnetic waves by particles or surfaces.
Scattering coefficient curves	Display of scatterometer data in which relative backscatter is shown as a function of incidence angle.
Scatterometer	Nonimaging radar device that quantitatively records backscatter of terrain as a function of incidence angle.
Scene	Area on the ground that is covered by an image or photograph.
Scotopic vision	Vision under conditions of low illumination, when only the rods are sensitive to light. Visual acuity under these conditions is highest in the blue part of the spectrum.
Seasat	NASA unmanned satellite that acquired L-band radar images in 1978.
Sensitivity	Degree to which a detector responds to electromagnetic energy incident on it.
Sensor	Device that receives electromagnetic radiation and converts it into a signal that can be recorded and displayed as either numerical data or an image.
Shaded relief	Shading added to an image that makes the image appear to have three-dimensional aspects. This type of enhancement is commonly done to satellite images and thematic maps utilizing digital topographic data to provide the appearance of terrain relief within the image.
Shuttle imaging radar (SIR)	L-band radar system deployed on the Space Shuttle.
Sidelap	Extent of lateral overlap between images acquired on adjacent flight lines.
Side-looking airborne radar (SLAR)	An airborne side scanning system for acquiring radar images.
Side-scanning sonar-	Active system for acquiring images of the seafloor using pulsed sound waves.
Side-scanning system-	or orbit path but offset to one side.
Signal	Information recorded by a remote sensing system.
Signal to noise ratio (S/N)	The ratio of the level of the signal carrying real information to that carrying spurious information as a result of defects in the system.
Silver halide	Silver salts that are especially sensitive to visible light and convert to metallic silver when developed.
SIR	Shuttle Imaging Radar, synthetic-aperture radar experiments carried aboard the NASA Space Shuttle in 1981 and 1984.

Skylab	U.S. Earth-orbiting workshop that housed three crews of three astronauts in 1973 and 1974.
Skylight	Component of light that is strongly scattered by the atmosphere and consists predominantly of shorter wavelengths.
Slant range	In radar, an imaginary line running between the antenna and the target.
Slant-range distance	Distance measured along the slant range.
Slant-range distortion	Geometric distortion of a slant-range image.
Slant-range image	In radar, an image in which objects are located at positions corresponding to their slant-range distances from the aircraft path. On slant-range images, the scale in the range direction is compressed in the near-range region
SLAR	Side-looking airborne radar.
SMIRR	Shuttle Multispectral Infrared Radiometer, a non-imaging spectroradiometer carried by the NASA Space Shuttle covering ten narrow wavebands in the 0.5-2.4 m range.
SMMR	Scanning Multichannel Microwave Radiometer, carried by Nimbus-7.
Smooth criterion	In radar, the relationship between surface roughness, depression angle, and wavelength that determines whether a surface will scatter the incident radar pulse in a smooth or intermediate fashion.
Software	Programs that control computer operations.
Sonar	Acronym for sound navigation ranging. Sonar is an active form of remote sensing that employs sonic energy to image the seafloor.
Space Shuttle	U.S. manned satellite program in the 1980s, officially called the Space Transportation System (STS).
Space Station	A planned series of three polar-orbiting, sun-synchronous satellites to be launched by NASA, the European Space Agency, and the Japanese Space Agency in the 1990s. They will carry a large range of remote-sensing devices.
Spatial-frequency filtering	The analysis of the spatial variations in DN of an image and the separation or suppression of selected frequency ranges.
Specific heat	The ratio of the heat capacity of unit mass of a material to the heat capacity of unit mass of water.
Spectral hue	A hue that is present in the spectral range of white light and is analyzed by a prism or diffraction grating.
Spectral reflectance	Reflectance of electromagnetic energy at specified wavelength intervals.
Spectral sensitivity	Response, or sensitivity, of a film or detector to radiation in different spectral regions.
Spectral vegetation index	An index of relative amount and vigor of vegetation. The index is calculated from two spectral bands of AVHRR imagery.
Spectrometer	Device for measuring intensity of radiation absorbed or reflected by a material as a function of wavelength.
Spectroradiometer	A device that measures the energy reflected or radiated by materials in narrow EM wavebands.
Spectrum	Continuous sequence of electromagnetic energy arranged according to wavelength or frequency.
Specular	Refers to a surface that is smooth with respect to the wavelength of incident energy.
SPOT	Système Probatoire d'Observation de la Terre. Unmanned French remote sensing satellite orbiting in the late 1980s.
Stefan-Boltzmann constant	$5.68 \times 10^{-12} \text{ W} \cdot \text{cm}^{-2} \cdot \text{K}^{-4}$.
Stefan-Boltzmann law	States that radiant flux of a blackbody is equal to the temperature to the fourth power times the Stefan-Boltzmann constant.
Stereo base	Distance between a pair of correlative points on a stereo pair that are oriented for stereo viewing.

Stereo model	Three-dimensional visual impression produced by viewing a pair of overlapping images through a stereoscope.
Stereo pair	Two overlapping images or photographs that may be viewed stereoscopically.
Stereopsis	The ability for objects to be perceived in three dimensions as a result of the parallax differences produced by the eye base.
Stereoscope	Binocular optical device for viewing overlapping images or diagrams. The left eye sees only the left image, and the right eye sees only the right image.
SSU	Stratosphere Sounding Unit, carried by NOAA-series satellites.
Subscene	A portion of an image that is used for detailed analysis.
Subtractive primary colors	Yellow, magenta, and cyan. When used as filters for white light, these colors remove blue, green and red light, respectively.
Sunglint	Bright reflectance of sunlight caused by ripples on water.
Sun-synchronous	Earth satellite orbit in which the orbit plane is nearly polar and the altitude is such that the satellite passes over all places on earth having the same latitude twice daily at the same local sun time.
Sun-synchronous orbit	A polar orbit where the satellite always crosses the Equator at the same local solar time.
Supervised classification	Digital-information extraction technique in which the operator provides training-site information that the computer uses to assign pixels to categories.
Surface phenomenon	Interaction between electromagnetic radiation and the surface of a material.
Surface roughness	See roughness.
Synthetic-aperture radar (SAR)	Radar system in which high azimuth resolution is achieved by storing and processing data on the Doppler shift of multiple return pulses in such a way as to give the effect of a much longer antenna.
Synthetic stereo images	Stereo images constructed through digital processing of a single image. Topographic data are used to calculate parallax.
System	Combination of components that constitute an imaging device.
Systematic distortion	Geometric irregularities on images that are caused by known and predictable characteristics.

T

Target	Object on the terrain of specific interest in a remote sensing investigation.
TDRS	Tracking and Data Relay Satellite
Telemeter	To transmit data by radio or microwave links.
Terrain	Surface of the earth.
Texture	Frequency of change and arrangement of tones on an image.
Thematic Data	Thematic data layers in a data set are layers of information that deal with a particular theme. These layers are typically related information that logically go together. Examples of thematic data would include a data layer whose contents are roads, railways, and river navigation routes.
Thematic Mapper (TM)	A cross-track scanner deployed on Landsat that records seven bands of data from the visible through the thermal IR regions.
Thermal capacity (c)	See heat capacity.
Thermal conductivity (K)	Measure of the rate at which heat will pass through a material, expressed in calories per centimeter per second per degree Centigrade.
Thermal crossover	On a plot of radiant temperature versus time, the point at which temperature curves for two different materials intersect.
Thermal diffusivity (k)	Governs the rate at which temperature changes within a substance, expressed in centimeters squared per second.

Thermal inertia (P)	Measure of the response of a material to temperature changes, expressed in calories per square centimeter per square root of second.
Thermal IR	IR region from 3 to 14 μm that is employed in remote sensing. This spectral region spans the radiant power peak of the earth.
Thermal IR image	Image acquired by a scanner that records radiation within the thermal IR band.
Thermal IR multispectral scanner (TIMS)	Airborne scanner that acquires multispectral images within the 8-to-14mm band of the thermal IR region.
Thermal model	Mathematical expression that relates thermal and other physical properties of a material to its temperature. Models may be used to predict temperature for given properties and conditions.
Thermography	thermograms, have been used to detect tumors and monitor blood circulation.
THIR	Temperature-Humidity Infrared Radiometer, carried by Nimbus-7.
Tie-point	used in the co-registration of images.
TIMS	Thermal IR multispectral scanner.
TM	Thematic Mapper.
Tone	Each distinguishable shade of gray from white to black on an image.
Topographic inversion	Ridges appear to be valleys, and valleys appear to be ridges. The illusion is corrected by orienting the image so that the shadows trend from the margin of the image to the bottom.
Topographic reversal	A geomorphic phenomenon in which topographic lows coincide with structural highs and vice versa. Valleys are eroded on crests of anticlines to cause topographic lows, and synclines form ridge, or topographic highs.
TOVS	
Tracking and Data Relay Satellite (TDRS)	Geostationary satellite used to communicate between ground receiving stations and satellite such as Landsat.
Training area	A sample of the Earth's surface with known properties; the statistics of the imaged data within the area are used to determine decision boundaries in classification.
Trade-off	As a result of changing one factor in a remote sensing system, there are compensating changes elsewhere in the system; such a compensating change is known as a trade-off.
Training site	Area of terrain with known properties or characteristics that is used in supervised classification.
Transmissivity	Property of a material that determines the amount of energy that can pass through the material.
Transparency	Image on a transparent photographic material, normally a positive image.
Transpiration	Expulsion of water vapor and oxygen by vegetation.
Travel time	In radar, the time interval between the generation of a pulse of microwave energy and its return from the terrain.
Tristimulus color theory	A theory of color relating all hues to the combined effects of three additive primary colors corresponding to the sensitivities of the three types of cone on the retina.
U	
Unsupervised classification	pixels to categories with no instructions from the operator.

UTM--Universal Transverse Mercator Projection	UTM is a widely used map projection that employs a series of identical projections around the world in the mid-latitude areas, each spanning six degrees of longitude and oriented to a meridian. This projection is characterized by its conformality; that is, it preserves angular relationships and scale plus it easily allows a rectangular grid to be superimposed on it. Many worldwide topographic and planimetric maps at scales ranging between 1:24,000 and 1:250,000 use this projection.
UV	wavelengths from 0.01 to 0.4m.
V	
Variance	A measure of the dispersion of the actual values of a variable about its mean. It is the mean of the squares of all the deviations from the mean value of a range of data.
VAS	Atmospheric Sounder, carried by GEOS satellites
Vector	Any quantity, which has both magnitude and direction, as opposed to scalar that has only magnitude.
Vector Data	Vector data, when used in the context of spatial or map information, refers to a format where all map data is stored as points, lines, and areas rather than as an image or continuous tone picture. These vector data have location and attribute information associated with them.
Vector format	The expression of points, lines, and areas on a map by digitized Cartesian coordinates, directions, and values.
Vegetation anomaly	Deviation from the normal distribution or properties of vegetation. Vegetation anomalies may be caused by faults, trace elements in soil, or other factors.
Vertical exaggeration	In a stereo model, the extent to which the vertical scale appears larger than the horizontal scale.
Vertical Positional Accuracy	Vertical positional accuracy is based upon the use of USGS source quadrangles, which are compiled to meet National Map Accuracy Standards (NMAS). NMAS vertical accuracy requires that at least 90 percent of well defined points tested be within one half contour interval of the correct value. Comparison to the graphic source is used as control to assess digital positional accuracy.
Vidicon	An imaging device based on a sheet of transparent material whose electrical conductivity increases with the intensity of EM radiation falling on it. The variation in conductivity across the plate is measured by a sweeping electron beam and converted into a video signal. Now largely replaced by cameras employing arrays of charge-coupled devices (ccds).
Vignetting	A gradual change in overall tone of an image from the center outwards, caused by the imaging device gathering less radiation from the periphery of its field of view than from the center. Most usually associated with the radially increasing angle between a lens and the Earth's surface, and the corresponding decrease in the light-gathering capacity of the lens.
Visible radiation	Energy at wavelengths from 0.4 to 0.7mm that is detectable by the human eye.
Visual dissonance	The disturbing effect of seeing a familiar object in an unfamiliar setting or in an unexpected color.
VISSR	Visible Infrared Spin-Scan Radiometer carried by the GOES satellites.
Volume scattering	In radar, interaction between electromagnetic radiation and the interior of a material.

W	
Watt (W)	Unit of electrical power equal to rate of work done by one ampere under a potential of one volt.
Wavelength	Distance between successive wave crests or other equivalent points in a harmonic wave.
Wien's displacement law	Describes the shift of the radiant power peak to shorter wavelengths as temperature increases.
WRS--Worldwide Reference System	The WRS is a global indexing scheme designed for the Landsat program based on nominal scene centers defined by path and row coordinates.
X	
X band	Radar wavelength region from 2.4 to 3.8 cm.
Y	
Yaw	Rotation of an aircraft about its vertical axis so that the longitudinal axis deviates left or right from the flight line.
Z	
ZENITH	Zenith is the point on the celestial sphere vertically above a given position or observer.
Zephyr	A Mediterranean term for any soft, gentle breeze.